

Amendments to the Claims:

This listing of claims will replace all prior version, and listings, of claims in the application.

Listing of Claims:

1. – 7. (Canceled)

8. (Previously Presented) A method for media delivery in a network, comprising the steps of:

(a) determining an available bandwidth for file transmission for a time interval, comprising the steps of:

(a1) updating a total available bandwidth for the time interval, comprising the steps of:

(a1i) reading from a plurality of database tables a plurality of live-video stream (LVS) jobs to begin during the time interval,

(a1ii) allocating bandwidth to the plurality of LVS jobs not yet allocated bandwidth, and

(a1iii) recording the allocated bandwidth to the plurality of LVS jobs in the plurality of database tables, and

(a2) checking for the available bandwidth for file transmission for the time interval, comprising the steps of:

(a2i) updating a global step function (GSF),

(a2ii) determining if enough bandwidth is available for file transmissions,

(a2iii) sending an indication if there is not enough bandwidth available for file transmission, and

(a2iv) finding a bandwidth strip which begins at a current time, fits under the GSF, has at least a minimum amount of bandwidth that must be allocated to a file transmission task, and does not extend, in the X/time-direction, beyond a latest delivery time (LDT) of the at least one transmission task; and

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth.

9. (Original) The method of claim 8, wherein the finding step (a2iv) comprises the step of:

(a2ivA) finding the bandwidth strip that extends in an X/time-direction from a current time to no more than a maximum transmission duration, and in a Y/bandwidth-direction from zero to no more than a value of the GSF at any X/time value spanned by the bandwidth strip;

(a2ivB) determining if an area of the bandwidth strip is no smaller than a predetermined area;

(a2ivC) indicating not enough bandwidth for file transmission if the area of the largest found bandwidth strip is smaller than the predetermined area, or is not within a plurality of pre-determined boundary conditions; and

(a2ivD) returning a size limitation for the at least one file transmission task if the area of the bandwidth strip is smaller than the predetermined area.

10. – 11. (Canceled)

12. (Previously Presented) A method for media delivery in a network, comprising the

steps of:

- (a) determining an available bandwidth for file transmission for a time interval; and
- (b) allocating at least a portion of the available bandwidth to at least one file

transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth, comprising the steps of:

- (b1) setting an upper bound on an amount of bandwidth to a smaller of the available bandwidth and a maximum bit rate of a plurality of receivers,
- (b2) gathering data for the at least one file transmission task, the gathered data including a size of the at least one file transmission task,
- (b3) determining an allocation strategy selected by a customer,
- (b4) computing an overhead for the at least one file transmission task, wherein the computing step (b4) comprises the steps of:

- (b4i) computing a total transmission overhead for the at least one file transmission task, and

- (b4ii) converting the task size and the total transmission overhead into an area,

- (b5) allocating the portion of the available bandwidth based on the upper bound, the size of the at least one transmission task, the computed overhead, and the allocation strategy selected by the customer, and

- (b6) recording the available bandwidth remaining after the allocation in a plurality of database tables.

13. (Previously Presented) A method for media delivery in a network, comprising the steps of:

- (a) determining an available bandwidth for file transmission for a time interval; and
- (b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth, comprising the steps of:
 - (b1) setting an upper bound on an amount of bandwidth to a smaller of the available bandwidth and a maximum bit rate of a plurality of receivers,
 - (b2) gathering data for the at least one file transmission task, the gathered data including a size of the at least one file transmission task,
 - (b3) determining an allocation strategy selected by a customer,
 - (b4) computing an overhead for the at least one file transmission task,
 - (b5) allocating the portion of the available bandwidth based on the upper bound, the size of the at least one transmission task, the computed overhead, and the allocation strategy selected by the customer, wherein the allocating step (b5) comprises the steps of:
 - (b5i) determining if the at least one file transmission task can be completed before a deadline,
 - (b5ii) returning an error if the at least one file transmission task can not be completed before the deadline,
 - (b5iii) allocating a lowest possible bandwidth strip to meet the deadline to the at least one file transmission task if the bandwidth allocation strategy is Minimum Possible Bandwidth,
 - (b5iv) allocating a highest possible bandwidth strip to meet the deadline if the bandwidth allocation strategy is Maximum Possible Bandwidth,
 - (b5v) determining if the allocating step (b5iv) completed successfully,
 - (b5vi) returning an error if the allocating step (b5iv) did not complete

successfully, and

(b5vii) setting the allocated bandwidth and duration of allocation in the task data if the allocating step (b5iv) completed successfully,

(b6) recording the available bandwidth remaining after the allocation in a plurality of database tables.

14. (Canceled)

15. (Previously Presented) A method for media delivery in a network, comprising the steps of:

(a) determining an available bandwidth for completion of a file transmission for a time interval, wherein the time interval is a current time plus a maximum duration for a completion of at least one file transmission task;

(b) allocating at least a portion of the available bandwidth to complete the at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth; and

(c) freeing any allocated available bandwidth unused by a complete transmission of the at least one file transmission task, comprising:

(c1) updating a global step function (GSF), wherein the GSF represents a total maximum bandwidth available in the network in the time interval for completion of the file transmission;

(c2) constructing a payback strip from the portion of the available bandwidth allocated to the at least one file transmission task;

(c3) adding the payback strip to the GSF; and

(c4) recording an available bandwidth remaining after the adding step (c3) in a plurality of database tables.

16. (Previously Presented) A method for media delivery in a network, comprising the steps of:

(a) determining an available bandwidth for file transmission for a time interval;

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth; and

(c) freeing any allocated available bandwidth unused by a transmission of the at least one file transmission task, comprising the steps of:

(c1) updating a global step function (GSF),

(c2) constructing a payback strip from the portion of the available bandwidth allocated to the at least one file transmission task, comprising the steps of:

(c2i) finding an expiration time corresponding to the at least one file transmission task in the plurality of database tables, and

(c2ii) constructing the payback strip that extends in an X/time-direction until the expiration time and in a Y/bandwidth direction from zero to the portion of the available bandwidth allocated to the at least one file transmission task,

(c3) adding the payback strip to the GSF, and

(c4) recording an available bandwidth remaining after the adding step (c3) in a plurality of database tables.

17. – 25. (Canceled)

26. (Previously Presented) A computer readable medium with program instructions for media delivery in a network, the instructions for:

(a) determining an available bandwidth for file transmission for a time interval, comprising the instructions for:

(a1) updating a total available bandwidth for the time interval, comprising the instructions for:

(a1i) reading from a plurality of database tables a plurality of live-video stream (LVS) jobs to begin during the time interval,

(a1ii) allocating bandwidth to the plurality of LVS jobs not yet allocated bandwidth, and

(a1iii) recording the allocated bandwidth to the plurality of LVS jobs in the plurality of database tables, and

(a2) checking for the available bandwidth for file transmission for the time interval, comprising the steps of:

(a2i) updating a global step function (GSF),

(a2ii) determining if enough bandwidth is available for file transmissions,

(a2iii) sending an indication if there is not enough bandwidth available for file transmission, and

(a2iv) finding a bandwidth strip which begins at a current time, fits under the GSF, has at least a minimum amount of bandwidth that must be allocated to a file transmission task, and does not extend, in the X/time-direction, beyond a LDT of the at least one transmission task; and

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a

different amount of the available bandwidth.

27. (Original) The medium of claim 26, wherein the finding instruction (a2iv) comprises the instructions for:

(a2ivA) finding the bandwidth strip that extends in an X/time-direction from a current time to no more than a maximum transmission duration, and in a Y/bandwidth-direction from zero to no more than a value of the GSF at any X/time value spanned by the bandwidth strip;

(a2ivB) determining if an area of the bandwidth strip is no smaller than a predetermined area;

(a2ivC) indicating not enough bandwidth for file transmission if the area of the largest found bandwidth strip is smaller than the predetermined area, or is not within a plurality of predetermined boundary conditions; and

(a2ivD) returning a size limitation for the at least one file transmission task if the area of the bandwidth strip is smaller than the predetermined area.

28. – 29. (Canceled)

30. (Previously Presented) A computer readable medium with program instructions for media delivery in a network, the instructions for:

(a) determining an available bandwidth for file transmission for a time interval; and

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth, comprising the instructions for:

(b1) setting an upper bound on an amount of bandwidth to a smaller of the

available bandwidth and a maximum bit rate of a plurality of receivers,

(b2) gathering data for the at least one file transmission task, the gathered data including a size of the at least one file transmission task,

(b3) determining an allocation strategy selected by a customer,

(b4) computing an overhead for the at least one file transmission task,

wherein the computing instruction (b4) comprises the steps of:

(b4i) computing a total transmission overhead for the at least one file transmission task; and

(b4ii) converting the task size and the total transmission overhead into an area,

(b5) allocating the portion of the available bandwidth based on the upper bound, the size of the at least one transmission task, the computed overhead, and the allocation strategy selected by the customer, and

(b6) recording the available bandwidth remaining after the allocation in a plurality of database tables.

31. (Previously Presented) A computer readable medium with program instructions for media delivery in a network, the instructions for:

(a) determining an available bandwidth for file transmission for a time interval; and

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth, comprising the instructions for:

(b1) setting an upper bound on an amount of bandwidth to a smaller of the available bandwidth and a maximum bit rate of a plurality of receivers,

- (b2) gathering data for the at least one file transmission task, the gathered data including a size of the at least one file transmission task,
- (b3) determining an allocation strategy selected by a customer,
- (b4) computing an overhead for the at least one file transmission task,
- (b5) allocating the portion of the available bandwidth based on the upper bound, the size of the at least one transmission task, the computed overhead, and the allocation strategy selected by the customer, wherein the allocating instruction (b5) comprises the instructions for:
 - (b5i) determining if the at least one file transmission task can be completed before a deadline;
 - (b5ii) returning an error if the at least one file transmission task can not be completed before the deadline;
 - (b5iii) allocating a lowest possible bandwidth strip to meet the deadline to the at least one file transmission task if the bandwidth allocation strategy is Minimum Possible Bandwidth;
 - (b5iv) allocating a highest possible bandwidth strip to meet the deadline if the bandwidth allocation strategy is Maximum Possible Bandwidth;
 - (b5v) determining if the allocating step (b5iv) completed successfully;
 - (b5vi) returning an error if the allocating step (b5iv) did not complete successfully; and
 - (b5vii) setting the allocated bandwidth and duration of allocation in the task data if the allocating step (b5iv) completed successfully; and
- (b6) recording the available bandwidth remaining after the allocation in a plurality of database tables.

32. (Canceled)

33. (Previously Presented) A computer readable medium with program instructions for media delivery in a network, the instructions for:

(a) determining an available bandwidth for completion of a file transmission for a time interval, wherein the time interval is a current time plus a maximum duration for a completion of at least one file transmission task;

(b) allocating at least a portion of the available bandwidth to complete the at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth;

(c) freeing any allocated available bandwidth unused by a complete transmission of the at least one file transmission task, comprising:

(c1) updating a global step function (GSF), wherein the GSF represents a total maximum bandwidth available in the network in the time interval for completion of the file transmission;

(c2) constructing a payback strip from the portion of the available bandwidth allocated to the at least one file transmission task;

(c3) adding the payback strip to the GSF; and

(c4) recording an available bandwidth remaining after the adding step (c3) in a plurality of database tables.

34. (Previously Presented) A computer readable medium with program instructions for media delivery in a network, the instructions for:

(a) determining an available bandwidth for file transmission for a time interval;

(b) allocating at least a portion of the available bandwidth to at least one file transmission task, wherein each of the at least one file transmission task may be allocated a different amount of the available bandwidth; and

(c) freeing any allocated available bandwidth unused by a transmission of the at least one file transmission task, comprising the instructions for:

(c1) updating a global step function (GSF),

(c2) constructing a payback strip from the portion of the available bandwidth allocated to the at least one file transmission task, comprising the instructions for:

(c2i) finding an expiration time corresponding to the at least one file transmission task in the plurality of database tables, and

(c2ii) constructing the payback strip that extends in an X/time-direction until the expiration time and in a Y/bandwidth direction from zero to the portion of the available bandwidth allocated to the at least one file transmission task,

(c3) adding the payback strip to the GSF, and

(c4) recording an available bandwidth remaining after the adding step (c3) in a plurality of database tables.

35. – 43. (Canceled)

44. (New) The method of claim 16, wherein the at least one file transmission task is scheduled back-to-back when duration of allocations are known when the allocations are made.

45. (New) The method of claim 16, wherein the allocation of the available bandwidth to the at least one file transmission task is varied as a polynomial in time.

46. (New) The medium of claim 34, wherein the at least one file transmission task is scheduled back-to-back when duration of allocations are known when the allocations are made.

47. (New) The medium of claim 34, wherein the allocation of the available bandwidth to the at least one file transmission task is varied as a polynomial in time.